CLASS 358, FACSIMILE AND STATIC PRESENTATION PROCESSING

SECTION I - CLASS DEFINITION

GENERAL STATEMENT OF THE CLASS SUBJECT MATTER

This class deals with the communication or reproduction of a static image or sequence of static images in which the local light, or density variations composing the image do not vary with time (e.g., a document image) by a method or apparatus involving at least one of the following steps: (1) scanning a static image to capture an image-containing area by resolving it into an area or a plurality of areas of which at least one of the two dimensions is elemental, simultaneously or in a sequence, and the generation in response thereto of an image-representative signal or image-representative data; (2) communication of an image-representative signal or image-representative data over any supporting communication network; or (3) reproduction of an image-containing area in response to an image-representative signal or image-representative image data by reproducing a corresponding image area or a plurality of image areas of which at least one of the two dimensions is elemental, simultaneously or in a sequence.

In this class, a facsimile system or method is a system or method for the communication or reproduction of an arbitrarily composed image in which the local light, or density variations composing the image do not vary with time, such as documents (both written and printed), maps, charts, photographs, etc., but not motion picture film or video.

Communication of an image-representative signal or image-representative data (i.e., facsimile communication) is over an analog network or a digital network and involves one or more of the means or steps of transmitting, receiving, relaying, storing & forwarding, storing & retrieving, etc. Reproduction involves the presentation of an image-representative signal or image-representative data on a fixed medium, such as paper (i.e., static data presentation or printing).

This class also provides for a system or method for processing an image-representative signal or image-representative data in combination with, or to specifically enable or enhance, communication or reproduction thereof.

This class also provides for a system or method for processing an image-representative signal or image-repre-

sentative data to engrave a printing form, and where not otherwise classified, provides for the mechanical or structural arrangements, and control thereof, for engraving a printing surface to create a printing form.

SUBCOMBINATIONS OF FACSIMILE COMMUNICATION AND STATIC DATA PRESENTATION SYSTEMS

This class includes circuits, devices, or systems specially designed for dealing with communication of an image-representative signal or image-representative data (i.e., facsimile communication) and static data presentation of an image-representative signal or image-representative data (i.e., printing), as distinct from merely signals or data corresponding to a particular frequency range. Electrical or electronic circuits, devices, or systems not specific to facsimile communication and static data presentation, which may constitute sub combinations of such apparatus, are classified in the appropriate class for such circuits, devices, or systems.

LINES WITH OTHER CLASSES AND WITHIN THIS CLASS COMBINATIONS OF OTHER APPARATUS WHICH INCLUDE APPARATUS OF THIS CLASS

This class does not include the following subject matter:

1. Systems in which an alphanumeric or like character of an image-representative signal or image-representative data, which may be generated according to step (1) above, is recognized by comparison with stored information or by other means, are dealt with elsewhere. (See References to Other Classes, below.)

2. Systems for photographic copying or photocopying by direct optical reproduction of an original image in which a signal or data of a characteristic of the image may be derived and employed to modify the operation of the system, are dealt with elsewhere. (See References to Other Classes, below.)

3. Systems for the reproduction of an image as in step (3) above, but which involve an image-representative signal or image-representative data corresponding to graphical image data or an alphanumeric or like character, which, unlike step (3) above, is produced from a signal generated by cams, punched card, or tape, or from a coded control signal or by other means (e.g., computer generated), are dealt with elsewhere. (See References to Other Classes, below.)

4. Facsimile communication over a telephone line or

network is dealt with elsewhere. (See References to Other Classes, below.)

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

D14,   Recording, Communication, or Information Retrieval Equipment, subclasses 462 through 471 for design of facsimile equipment components such as the housing, console, platen, handset, carrying case, etc.

D18,   Printing and Office Machinery, subclass 50 for printing equipment design, and subclass 54 for text or data printer design.

101,   Printing, appropriate subclasses for producing characters or designs on surfaces by impression of types or dies or by applying coating material thereto through openings of previous portions of a pattern sheet, as in stenciling, or by impression from Plano graphic or intaglio surfaces.

250,   Radiant Energy, subclasses 200 through 239 for photocells, and circuits and optics used therewith.

324,   Electricity: Measuring and Testing, appropriate subclasses for measuring, testing (or sensing) of electric properties.

327,   Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous signal discriminating or separating and miscellaneous signal production or conversion.

329,   Demodulators, appropriate subclasses for pulse, frequency, phase, or amplitude demodulators.

341,   Coded Data Generation or Conversion, appropriate subclasses for code converters wherein the signal may be encoded to reduce bandwidth.

342,   Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for radar systems.

345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 418 through 475 for computer graphics processing, especially subclasses 581-618 for display attribute control.

346,   Recorders, appropriate subclasses for electric recording of phenomenon.

347,   Incremental Printing of Symbolic Information, subclasses 1 through 109 for ink jet printing, subclasses 111-117 for electrical marking including image formation by electrostatic charge, particularly subclasses 129-151 for photo scanning, subclasses 171-223 for thermal printing, and subclasses 224-264 for marking a record receiver with light or a beam.

348,   Television, appropriate subclasses for television or video camera, television or video display, television or video transmission, television or video bandwidth reduction, television or video signal processing, or television or video special applications.

352,   Optics: Motion Pictures, subclasses 4 and 131 for prompters and motion picture-television combinations, and subclasses 166-197 for projector drive mechanisms.

355,   Photocopying, appropriate subclasses for photographic copying or photocopying by direct optical reproduction of an original image, subclass 38 for systems for in which a signal or data of a characteristic of the image may be derived and employed to modify the operation of the system.

356,   Optics: Measuring and Testing, appropriate subclasses for analyzing light to measure or test characteristics, such as intensity, color and polarization.

359,   Optical: Systems and Elements, appropriate subclasses for optical devices.

361,   Electricity: Electrical Systems and Devices, subclasses 679 through 820 for housing or mounting assemblies for electronic systems and devices.

370,   Multiplex Communications, appropriate subclasses for multiplex systems in general.

375,   Pulse or Digital Communications, various subclasses for pulse or digital communication systems, and subclasses 240.01 through 240.29 for digital implementations of bandwidth reduction, compression, or expansion techniques of television or motion video signals or motion image data.

379,   Telephonic Communications, appropriate subclasses for voice communication over a telephone line, subclasses 93.01 through 93.37 for transmission of a digital message signal over a telephone line, and subclasses 100-01-100.17 for transmission of a facsimile signal over a telephone line or network.

380,   Cryptography, subclasses 200 through 242 for video cryptography, and subclass 243 for facsimile cryptography.

382,   Image Analysis, subclasses 162 through 167 for color image processing, subclasses 173-180 for image segmentation, subclasses 181-231 for pattern recognition or alphanumeric character, subclasses 232-253 for image compression or coding, subclasses 254-275 for image enhancement and restoration, subclasses 276-311 for image transformation and preprocessing, and subclasses 312-324 for image sensing.

385,   Optical Waveguides, appropriate subclasses for fiber optics, per se.

386,   Television Signal Processing for Dynamic Recording or Reproducing, appropriate subclasses for recording or reproducing color or black and white television signals.

396,   Photography, appropriate subclasses for pictorial information recording devices.

399,   Electrophotography, appropriate subclasses for reproducing an original (e.g., document) by optically projecting light directly from the original to a photoconductive member to produce an electrostatic latent image which is made visible by development, the developed image then being made permanent by transfer and fixing to a copy medium, such as paper. This class provides for the sub combinations directed to charging, developing, transferring, fixing, cleaning, sheet feeding, or document handling in an electro photographic apparatus whether or not the imaging light is directly from the original. This class also provides for methods and means for perfecting the electro photographic apparatus (e.g., control of electro photographic process, diagnostics, operator interface, etc.).

409,   Gear Cutting, Milling or Planing, subclasses 64 through 242 for milling, per se, and subclasses 2, 79, 245, and 289 for controlling or regulating a pattern of cutting, milling, or planing by supplied information.

430,   Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for process, composition, and product involving radiation imagery chemistry.

455,   Telecommunications, appropriate subclasses for modulated carrier wave communications not elsewhere classified.

505,   Superconducter Technology:Apparatus, Material, Process, subclass 150 for high super conducting devices, particularly subclasses 181-183 for photoconductive, light transmissive, light emissive, or light responsive devices, or subclass 202 for electrical communication systems.

700,   Data Processing: Generic Control Systems or Specific Applications, subclasses 245 through 264 for data processing of robot control systems.

704,   Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclasses 500 through 504 for bandwidth, or time compression, or expansion of audio signals.

706,   Data Processing: Artificial Intelligence, appropriate subclasses for artificial intelligence systems that represent, apply, and acquire knowledge.

709,   Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring or Plural Processor Synchronization, appropriate subclasses for transferring data or instruction information between a plurality of computers or processes wherein the computers or processes employ the data or instructions before or after transferring.

710,   Electrical Computers and Digital Data Processing Systems: Input/Output, appropriate subclasses for transferring data from one or more peripherals to one or more computers or digital data processing systems, interconnecting or communicating between two or more components connected to a bus within a single computer or digital data processing system, regulated access to shared resources and managing current processing functions within a computer or digital data processing system.

713,   Electrical Computers and Digital Processing Systems: Support, subclasses 150 through 202 for computer access and communication security.

714,   Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses for digital data error handling.

715,   Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses 500 through 542 for document processing performed by a computer for presentation, and subclasses 700-866 for operator interface processing.

725,   Interactive Video Distribution Systems, appropriate subclasses for interactive video distribution processes, systems, and elements thereof.

SUBCLASSES

1.1 **STATIC PRESENTATION PROCESSING (E.G., PROCESSING DATA FOR PRINTER, ETC.):**
This subclass is indented under the class definition. Subject matter comprising digital data processing system or method for static presentation (i.e., printing a hard copy), wherein the processing of data is specifically for presentation on a fixed medium, such as paper.

(1) Note. This subclass and its indents provide for claims directed to digital data processing for static presentation on fixed medium with nominal recitation of the printer or recorder mechanical or structural features.

(2) Note. Printers or recorders in which the structural, mechanical, electromechanical, electrochemical, photochemical, photoelectric, magnetic, or optical elements, or control circuitry or hardware associated with such elements, is substantially claimed, and which may include nominally recited digital data processing for static presentation, are generally not classified here, see search notes below for appropriate class or subclass.

(3) Note. An exception to the above note would be where claims are directed to either data processing or a mechanical or structural arrangement, or control thereof, for engraving a printing surface to create a printing forme as provided for below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3 through 3.25, for bi-level, multi-level, and adaptive image reproduction.
3.26 through 3.27, for image reproduction enhancement
3.28, for image reproduction with watermarks
3.29 through 3.32, for engraving a printing forme.

SEE OR SEARCH CLASS:
101, Printing, appropriate subclasses for producing characters or designs on surfaces by impression of types or dies or by applying coating material thereto through openings of previous portions of a pattern sheet, as in stenciling, or by impression from Plano graphic or intaglio surfaces.
347, Incremental Printing of Symbolic Information, subclasses 1 through 109 for ink jet printing, subclasses 111-117 for electrical marking including image formation by electrostatic charge, particularly subclasses 129-151 for photo scanning, subclasses 171-223 for thermal printing, and subclasses 224-264 for marking a record receiver with light or a beam.
355, Photocopying, appropriate subclasses for photographic copying or photocopying by direct optical reproduction of an original image, subclass 38 for systems for in which a signal or data of a characteristic of the image may be derived and employed to modify the operation of the system.
382, Image Analysis, subclasses 162 through 167 for color image processing, subclasses 173-180 for image segmentation, subclasses 181-231 for pattern recognition or alphanumeric character, subclasses 232-253 for image compression or coding, subclasses 254-275 for image enhancement and restoration, subclasses 276-311 for image transformation and preprocessing, and subclasses 312-324 for image sensing.
386, Television Signal Processing for Dynamic Recording or Reproducing, appropriate subclasses for recording or reproducing color or black and white television signals.
396, Photography, appropriate subclasses for pictorial information recording devices.
399, Electrophotography, appropriate subclasses for reproducing an original (e.g., document) by optically projecting light directly from the original to a photoconductive member to produce an electrostatic latent image which is made visible by development, the developed image then being made permanent by transfer and fixing to a copy medium, such as paper. This class provides for the sub combina-

tions directed to charging, developing, transferring, fixing, cleaning, sheet feeding, or document handling in an electro photographic apparatus whether or not the imaging light is directly from the original. This class also provides for methods and means for perfecting the electro photographic apparatus (e.g., control of electro photographic process, diagnostics, operator interface, etc.).

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for process, composition, and product involving radiation imagery chemistry.

707, Data Processing: Database and File Management or Data Structures, subclasses 500 through 542 for document processing.

1.2 Size, resolution, or scale control:
This subclass is indented under 1.1. Subject matter wherein the image data presented is magnified, reduced, proportioned, or the number of dots is changed.

1.3 Plotter:
This subclass is indented under 1.1. Subject matter wherein presentation is performed by X-Y movement of a marking means wherein the motion is controlled by the presentation data.

SEE OR SEARCH CLASS:
346, Recorders, subclass 29 for multiple input plotter structure; subclass 46 for color plotter structure; subclass 49 for multiple markers; and subclass 139 for plotter head structure.

1.4 Plural marking means:
This subclass is indented under 1.1. Subject matter wherein more than one independently movable or different type of writing element is used for presenting the processed data.

SEE OR SEARCH CLASS:
346, Recorders, subclass 46 for plural marker structure including color or multiple marking means and subclass 139 for structural elements of a carriage.

1.5 Position or velocity determined:
This subclass is indented under 1.1. Subject matter wherein the position or speed of the marking means or image medium modifies the presentation of the data.

1.6 Specific to image source:
This subclass is indented under 1.1. Subject matter wherein an image data format or processing thereof is designed to function with a particular image supply.

1.7 Flying dot (e.g., laser beam, etc.):
This subclass is indented under 1.1. Subject matter wherein the presentation on a fixed medium is produced by means of a continuously moving beam or stream of ink, light, ions, electrons, or radiation.

SEE OR SEARCH CLASS:
346, Recorders, subclass 107.3 for details of phenomenal recorders including mirror galvanometer.

347, Incremental Printing of Symbolic Information, subclasses 120 through 128 for marking the medium by information carrying flow of invisible charged particles, subclasses 129-140 for electrostatic marking apparatus including photo scanning device, subclasses 225-231 for apparatus and processes for marking a record receiver by scanning the record receiver with a writing light beam, and subclasses 226-231 for cathode ray scanner.

1.8 Dot matrix array (e.g., printheads, etc.):
This subclass is indented under 1.1. Subject matter wherein presentation of processed data is produced by means of an array of plural writing elements that are in a fixed position relative to each other.

SEE OR SEARCH CLASS:
347, Incremental Printing of Symbolic Information, subclasses 1 through 109 for selective marking by ink jet, subclasses 171-223 for thermal marking using thermal printhead, subclasses 233-245 for structure of a multiple beam scanner (e.g., LEDs), subclasses 129-140 for electrostatic marking

apparatus including photo scanning device, and particularly subclass 130 for such apparatus using light emitting diodes.

400,   Typewriting Machines, subclasses 120.01 through 120.18   for thermal recording typewriters and subclasses 124.01-124.32 for wire dot matrix typewriters.

1.9   Attribute control:
This subclass is indented under subclass 1.1. Subject matter wherein the data processing for static presentation is performed to correct, enhance, restore, or otherwise control a visual attribute, of an image reproduced for static presentation, such as color, contrast, resolution, density, etc.

(1)   Note. For example, by halftone or other gray level processing technique.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 589 through 590   for processing data to control a characteristic of an object or portion of an image displayed for visual viewing on a monitor or other selective (dynamic) display device.

1.11   Character or font:
This subclass is indented under 1.1.   Subject matter wherein the processing of presentation data generates or retrieves patterns defining alphanumerics.

1.12   Detail of medium positioning (e.g., movement to or from presentation location of medium, etc.):
This subclass is indented under 1.1.   Subject matter wherein the presentation data affects or is affected by the movement of the fixed medium to or from the location of the actual presentation.

SEE OR SEARCH CLASS:
271,   Sheet Feeding or Delivering, appropriate subclasses for sheet feeding or delivering, per se.
346,   Recorders, subclass 134 for means for driving record receivers for recorders.

399,   Electrophotography, subclasses 361 through 410 for a document handling apparatus in a photocopier.

1.13   Emulation or plural modes:
This subclass is indented under 1.1.   Subject matter wherein data is modified such that a presentation system responds like, reacts like, or imitates another type of presentation system or has more than one mode of operation.

1.14   Data corruption, power interruption, or print prevention:
This subclass is indented under 1.1.   Subject matter wherein the presentation operation is performed in which a system, device, or event is monitored for error, fault, malfunction, or deviation; or security consideration for expected results or steps are taken to prevent the occurrence of such error or to prevent the presentation operation.

SEE OR SEARCH CLASS:
713,   Electrical Computers and Digital Processing Systems: Support, subclasses 300 through 340 for computer power control, in general.

1.15   Communication:
This subclass is indented under 1.1.   Subject matter having details of communication between elements within a static presentation system.

SEE OR SEARCH CLASS:
346,   Recorders, subclass 107.3 for detail of phenomenal recorders including mirror galvanometer.
709,   Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring or Plural Processor Synchronization, subclass 247 for compressing/decompressing in computer-to-computer data transferring,.

1.16   Memory:
This subclass is indented under 1.1.   Subject matter having details of memory configuration, storage, or retrieval of data to be presented.

1.17   Page or frame memory:
This subclass is indented under 1.16.   Subject matter wherein a significant portion of the

data is stored as a contiguous unit in the form to be presented.

1.18   **Detail of image placement or content:**
This subclass is indented under 1.1.   Subject matter wherein the format of the presentation data is controlled.

2.1   **Processing based on at least two different image attributes (e.g., character, graphic, photo, line, edge, gray-line, color):**
This subclass is indented under subclass 1.9. Subject matter wherein image data is directed to or selected from at least two separate or different types of image processing for reproduction, based on different types or attributes of the original image or portions of the original image (e.g., character, graphic, photo, line, edge, gray-level, color).

    (1)   Note. The separate or different types of image processing for reproduction may involve feedback control and may be performed either selectively or adaptively based on single or mixed types or attributes of the original image or portions of the original image, the image types or attributes being discriminated, designated, or otherwise identified (e.g., by image analysis, user input, or meta data).

SEE OR SEARCH CLASS:
382,   Image Analysis, subclasses 173 and 176 for operations carried out on an image so that certain meaningful regions of patterns of interest are distinguishable from other regions or patterns such as identifying regions of text from other regions on a document.

2.99   **Bi-level image reproduction (e.g., character or line reproduction):**
This subclass is indented under subclass 1.9. Subject matter wherein each elemental value of an image or a selected portion of an image is processed, to generate a print element having two (i.e., binary) density levels, to represent the bi-level image in a bi-level image reproduction.

    (1)   Note. The selected portions of an image are usually text, character, or line regions.

    (2)   Note. The image processing is usually done by a fixed threshold where density levels are black and white to represent the image.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.27   through 3.28, for preventing stair stepping or jaggedness of a line edge or for smoothing or enhancing a line edge.

3   **Bi-level image reproduction (e.g., character or line reproduction):**
This subclass is indented under subclass 1.9. Subject matter wherein each elemental value of an image or a selected portion of an image is processed, to generate a print element having two (i.e., binary) density levels, to represent the bi-level image in a bi-level image reproduction.

    (1)   Note. For example portions of an image are usually text, a character, or a line region.

    (2)   Note. The image processing is done by a fixed threshold where density levels are black and white to represent the image.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.27   through 3.28, for preventing stair stepping or jaggedness of a line edge or for smoothing or enhancing a line edge.

3.01   **Multi-level image reproduction (e.g., gray level reproduction):**
This subclass is indented under subclass 1.9. Subject matter wherein a continuous tone or continuous density image, an image where density can vary continuously, is processed to generate an image with multiple discrete density levels (e.g., a gray level or grayscale image), which represents the continuous tone image in a multi-level image reproduction (i.e., an image reproduced with multiple discrete density levels).

(1) Note. An image of continuously varying density or tone may be a photograph or other pictorial image.

SEE OR SEARCH CLASS:
345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 589 through 590 for processing, or adjusting the range of, the intensity or gray scale of image data displayed for visual viewing on a monitor or other selective (dynamic) display device, subclasses 690-697 for display driver control of the intensity or gray scale of image data to be displayed, and subclasses 63, 77, and 89 for selective electrical control of the light intensity or gray scale level of the image data to be displayed on various types of selective (dynamic) display devices.
347, Incremental Printing of Symbolic Information, subclasses 15, 131, 188, 240, and 251-254 for controlling the output of an incremental print element (e.g., ink jet, heating current, or light beam) to perform a graduated density of marking on a recording medium.
348, Television, subclasses 254 through 256 and 671-686 for gray scale transformation of TV signals.
382, Image Analysis, subclass 237 for generic coding of a multi-bit pixel values representing discrete gray levels of an image into single bit values representing a bi-level image and subclasses 270-273 for quantization of an input analog or gray scale image to produce an output gray scale image or bit map utilizes a threshold, gain or slice level which self-adjusts according to characteristics such as the contrast or brightness of the image or portion of the image being processed.
399, Electrophotography, subclasses 180 through 181 for conducting or projecting radiant energy in the form of light from an original to a photoconductive image-bearing member via a screen or lattice having a line or dot pattern thereon at a specified angle.

3.02 Print element property varied to represent gray level:
This subclass is indented under subclass 3.01. Subject matter wherein a property of a single print element (e.g., a print dot) is varied to represent a gray level of an image element or picture element (e.g., a pixel).

(1) Note. The print element forming a gray level is referred to with various terminologies such as a "dot" or "pixel", and this terminology should not be confused with the same or similar terminology used to refer to original image elements.

(2) Note. A property could be size, shape, or density, for example.

(3) Note. Examples of terminology often used to refer to an image or picture element are "pel" or "pixel".

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.09 through 3.12, for variation of a property of a print element in an array of one or more print elements to form a halftone.

SEE OR SEARCH CLASS:
345, Computer Graphics Processing and Selective Visual Display Systems, subclass 589 for controlling the intensity or gray scale of a pixel in an image displayed for visual viewing on a monitor or other selective (dynamic) display device, subclasses 690-697 for display driver control of the intensity or gray scale of a pixel in an image to be displayed, and subclasses 63, 77, and 89 for selective electrical control of the light intensity or gray scale level of a pixel in an image to be displayed on various types of selective (dynamic) display devices.

3.03 Error diffusion in gray level or halftone generation:
This subclass is indented under subclass 3.01. Subject matter wherein the difference or error between a density value of a continuous tone or multi-level (gray level) image and the resulting density value after a thresholding or quantiza-

tion process is used to convert the continuous tone image to a multi-level image or to convert the multi-level image to a halftone image (i.e., a thresholding or quantization error) is distributed or added to unprocessed density values of the continuous tone or multi-level image.

(1)   Note. The error distribution is usually a fractional distribution done by a weighing filter.

(2)   Note. The error distribution prevents an accumulation of errors and has the effect of a low pass spatial filter, reducing losses and the occurrence of artifacts, and improving the representation of the original image in the resulting image reproduction.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclass 616 for smoothing the attributes of an object or portion of an amage on a display by carrying over the error obtained while calculating a pixel value to calculations used to determine the next pixel value.
382,   Image Analysis, subclass 252 for generic quantization of a continuous or broad range of image values to a reduced number of output values where the error from quantization is distributed to surrounding image values yet to be quantized.

3.04   Property of error weighting filter (e.g., adaptive, deterministic, random):
This subclass is indented under subclass 3.03. Subject matter wherein the weighting factors or coefficients, and the shape or size of the error diffusion region used in the error diffusion filter are selected or modified to improve the visual representation of the continuous tone or multi-level (gray level) image by the resulting gray levels or halftones.

(1)   Note. Perturbing the weighting filter with noise (e.g., blue noise) or randomly varying the weighting factors has the effect of shifting the threshold levels or quantization steps in such a way as to suppress low frequencies and distribute high frequencies, substantially avoiding

artifacts such as moire patterns in the reproduced image.

3.05   Adaptive error diffusion:
This subclass is indented under subclass 3.03. Subject matter wherein the distribution of the thresholding or quantization error is based on a property of the continuous tone or multi-level (gray level) image, results of previous thresholding or quantization, or other factors, to improve the visual representation of the reproduced gray level image using the resulting gray levels or halftones.

3.06   Halftoning (e.g., a pattern of print elements used to represent a gray level):
This subclass is indented under subclass 3.01. Subject matter wherein a discrete gray level of the multi-level image is processed or modulated to generate a halftone which is formed by a pattern of one or more print elements.

(1)   Note. The patterns or cells of print elements in a halftone image representation of a multi-level image are effectively demodulated by the eye to a density value (gray level) as a result of the low pass filtering effect of human vision, sometimes referred to as a spatial averaging or integration.

(2)   Note. The print elements are usually black dots.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 596, 599 for processing a gray level of an image, which would otherwise not be displayable, by using one or more pixels of varying size, density, or placement to visually simulate areas of gray or to approximate an undisplayable gray level on a monitor or other selective (dynamic) display device.
347,   Incremental Printing of Symbolic Information, subclasses 15, 131, 188, 240, 251-254 for controlling the output of an incremental print element (e.g., ink jet, heating current, or light beam) to perform a graduated density of marking on a recording medium.

348,   Television, subclasses 254   through 256 and 671-686 for gray scale transformation of TV signals.

382,   Image Analysis, subclass 237   for generic coding of a multi-bit pixel values representing discrete gray levels of an image into single bit values representing a bi-level image and subclasses 270 273 for quantization of an input analog or gray scale image to produce an output gray scale image or bit map utilizes a threshold, gain or slice level which self-adjusts according to characteristics such as the contrast or brightness of the image or portion of the image being processed.

399,   Electrophotography, subclasses 180 through 181 for conducting or projecting radiant energy in the form of light from an original to a photoconductive image-bearing member via a screen or lattice having a line or dot pattern thereon.

3.07   Rescreening (e.g., converting spatial resolution):
This subclass is indented under subclass 3.06. Subject matter wherein the halftone image is reprocessed to adjust the halftone image to a particular spatial resolution, or to adjust the spatial density of print elements forming the halftone.

SEE OR SEARCH THIS CLASS, SUBCLASS:
1.2,   for size, resolution, or scale control of presented image data by the image data being magnified, reduced, proportioned, or the number of dots changed.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclass 428 for adjusting the resolution of a graphic object displayed for visual viewing on a monitor or other selective (dynamic) display device.
382,   Image Analysis, subclasses 299 through 300 for increasing the resolution of a image by the addition of counterfeit pixels (or image elements) whose values are calculated (i.e.,

interpolated) based on values of neighboring real image pixels.

3.08   Descreening (e.g., inverse halftone conversion):
This subclass is indented under subclass 3.06. Subject matter wherein the halftone image is subjected to an inverse or reverse halftoning process to regenerate or approximate the original multi-level (gray level) image.

(1)   Note. This process may involve looking up the content of image restoration using an algorithm.

(2)   Note. Examples of particularly effective algorithms are those which use Bayesian techniques.

3.09   Print element property varied to effect halftone pattern:
This subclass is indented under subclass 3.06. Subject matter wherein a property or position of one or more print elements, in a cell of one or more print elements, is varied to effect a property of the halftone pattern, and consequently effect a property of the halftone image representation of the multi-level image.

(1)   Note. The multiple print elements forming a halftone pattern are referred to with various terminology such as dots, elementary dots, microdots, pixels, micro pixels, etc.; and this terminology should not be confused with the same or similar terminology used to refer to original image elements or the halftone patterns.

(2)   Note. A print element property or position is usually varied to improve spatial or tonal resolution, reduce artifacts, or provide enhancements.

(3)   Note. A print element property or position may be altered for gamma correction (e.g., correcting for the non-linear relationship between the input device and the printer).

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 596 through 599 for processing a gray level of an image,

which would otherwise not be displayable, by using one or more pixels of varying size, density, or placement to visually simulate areas of gray or to approximate an undisplayable gray level on a monitor or other selective (dynamic) display device.

3.1   **Density of print element (e.g., multi-level halftone):**
This subclass is indented under subclass 3.09. Subject matter wherein the density of a print element is varied in the halftone pattern.

(1)   Note. This is referred to as a multi-level, multi-bit, quasi, or pseudo halftone pattern.

(2)   Note. This is done in order to increase tonal resolution without loss of spatial resolution by using a print element of the same size with varying density in the halftone pattern, or to increase spatial resolution without loss of tonal resolution by using a smaller size print element of varying density in the halftone pattern.

3.11   **Shape of print element:**
This subclass is indented under subclass 3.09. Subject matter wherein the shape of a print element in the halftone is varied to affect a property of the halftone pattern.

3.12   **Size of print element:**
This subclass is indented under subclass 3.09. Subject matter wherein the size of a print element of the halftone is varied to affect a property of the halftone pattern.

(1)   Note. This is done by varying the size or growth of a print element for example.

3.13   **Dithering (e.g., spatial distribution of print elements by threshold matrix):**
This subclass is indented under subclass 3.06. Subject matter wherein the pattern or distribution of print elements forming a halftone pattern is determined by comparing a discrete density value (gray level) to an array of threshold values.

(1)   Note. An example of print elements are black dots.

(2)   Note. The array of threshold values, often referred to as a threshold or dither pattern, array, matrix, mask, grid, tile, cell, filter, or template, is replicated or tiled over a gray level image to form a halftone image.

(3)   Note. The profile of a halftone, sometimes referred to as the dot profile, is determined by the distribution of print elements representing a particular gray level at a given position in the multi-level image.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 596 through 599   for processing a gray level of an image, which would otherwise not be displayable, by using one or more pixels of varying size, density, or placement to visually simulate areas of gray or to approximate an undisplayable gray level on a monitor or other selective (dynamic) display device.
382,   Image Analysis, subclasses 270 through 273   for quantization of an input analog or gray scale image to produce an output gray scale image or bit map utilizes a threshold, gain or slice level which self-adjusts according to characteristics such as the contrast or brightness of the image or portion of the image being processed.

3.14   **Adaptive dithering:**
This subclass is indented under subclass 3.13. Subject matter wherein dithering is adapted to a point or local property of the multi-level (gray level) image and the resulting adaptive distribution of print elements or use of print elements having different properties to form a halftone pattern improves the visual accuracy of the halftone representation of the respective discrete density value (gray level), and consequently improves the overall visual accuracy of the halftone reproduction of the multi-level image.

3.15   **Edge adaptive:**
This subclass is indented under subclass 3.14. Subject matter wherein dithering is adapted to

an edge type feature determined by a density gradient or other property of the multi-level (gray level) image.

SEE OR SEARCH CLASS:
382,   Image Analysis, subclasses 199   and 266 for edge detection and enhancement in an image.

3.16   Ordered dithering (e.g., deterministic or systematic):
This subclass is indented under subclass 3.13. Subject matter wherein dithering produces an ordered pattern of print elements forming a halftone pattern, by thresholding a discrete density value (gray level) with a deterministic, usually periodic, array of threshold values.

(1)   Note. Blue noise masking is a type of systematic dithering which produces blue noise patterns of printing elements forming the halftone patterns representing gray levels in a halftone reproduced image with reduced graininess and without image artifacts such as moire patterns.

3.17   Clustered pattern:
This subclass is indented under subclass 3.16. Subject matter wherein dithering produces an ordered, concentrated pattern of print elements forming a halftone pattern, by thresholding a discrete density value (gray level) with a deterministic array of threshold values.

(1)   Note. Depending on the multi-level image, clustered dithering may cause artifacts or textures to appear in the resulting image reproduction.

(2)   Note. Patents directed to dithering with green noise, which involves a combination of dithering with blue noise and a clustered dot dithering pattern, should be classified here.

(3)   Note. The deterministic array of threshold values usually grows or spirals outward from a central print element position to provide perceived linearly increasing density level, but at a reduced overall spatial resolution.

3.18   Dispersed pattern:
This subclass is indented under subclass 3.16. Subject matter wherein dithering produces an ordered, dispersed pattern of print elements (e.g., black dots) forming a halftone pattern, the pattern of print elements providing smooth variations in tonal density and high frequency fidelity with a lower loss of overall spatial resolution, but having reduced linearity between tonal density and the number of print elements, in the resulting halftone pattern.

(1)   Note. An example of a dispersed pattern, which is commonly used, is the Bayer pattern.

3.19   Stochastic or random dithering:
This subclass is indented under subclass 3.13. Subject matter wherein a dithering process produces an unordered, randomly, or pseudo-randomly dispersed pattern of print elements (e.g., black dots) forming a halftone pattern with uncorrelated structure and without low frequency graininess.

3.2   Screen property or geometry (e.g., shape, period, symmetry, aspect ratio):
This subclass is indented under subclass 3.06. Subject matter wherein a property or geometry of the halftone screen is specified or varied.

(1)   Note. Such properties or geometry may include shape (e.g., square, rectangular, or hexagonal), period or frequency (i.e., spatial density) of locations on the screen for print element placement, period order (even or odd), symmetry of locations on the screen for print element placement, modulation angularity, ruling, or aspect ratio of the screen.

(2)   Note. The effects of different screen properties or geometry in the printed halftone image include print element shape and overlap, the level of spatial resolution and tone scale, and the amount of artifacts or aliasing, due to the effect of the screen property or geometry on the dithering or threshold arrays which make up the screen.

3.21   Adaptive multi-level image reproduction:
This subclass is indented under subclass 3.01. Subject matter, not otherwise provided for above, wherein one or more of the multiple discrete density values (gray levels) of an original multi-level image are adaptively processed or reproduced based on a density value or other property of the original multi-level image or of the reproduction, or based on a difference between the original multi-level image and the reproduction.

(1)   Note. The adaptive processing of the original multi-level image may also be in response to other factors and is performed in order to generate one or more gray levels, halftones, or halftone patterns in the reproduction of the original multi-level image, which alone or in combination result in an improved overall visual representation of the original multi-level (gray level) image.

(2)   Note. The adaptive processing may involve feedback control.

3.22   Variable threshold determined by image or other condition (e.g., adaptive thresholding):
This subclass is indented under subclass 3.21. Subject matter wherein the multi-level (gray level) image is further quantized to a reduced number of discrete gray levels using one or more threshold values which are varied depending on the original gray levels or other properties of the multi-level image or depending on the resulting image after thresholding.

(1)   Note. A threshold value may be adjusted or changed based an error resulting from thresholding (i.e., adaptive thresholding).

SEE OR SEARCH CLASS:
382,   Image Analysis, subclasses 270 through 273 for quantization of an input analog or gray scale image to produce an output gray scale image or bit map utilizes a threshold, gain or slice level which self-adjusts according to characteristics such as the contrast or brightness of the image or portion of the image being processed.

3.23   Look-up table for image processing or print attribute date (e.g. threshold value, print element property):
This subclass is indented under subclass 3.01. Subject matter wherein a look-up table stored in memory is accessed to obtain an individual threshold value, an array of threshold values, or other processing data, to be applied in the determination or formation of a gray level, halftone, or halftone pattern, or to obtain data on a print element property or other printing attribute, for use in a multi-level image reproduction.

3.24   Adaptive image reproduction:
This subclass is indented under subclass 1.9. Subject matter, not otherwise provided for above, wherein image reproduction is done adaptively based on attributes of the original image or the reproduced image.

(1)   Note. The adaptive image reproduction may involve feedback control.

SEE OR SEARCH CLASS:
382,   Image Analysis, subclasses 173   and 176 for operations carried out on an image so that certain meaningful regions of patterns of interest are distinguishable from other regions or patterns such as identifying regions of text from other regions on a document.

3.26   Distortion control in image reproduction (e.g., removing, reducing or preventing image artifacts):
This subclass is indented under subclass 1.9. Subject matter wherein image data or print data is filtered or otherwise processed, to remove, reduce, or prevent an artifact, noise, distortion, aberration, aliasing, or other error in the reproduced image.

(1)   Note. Artifacts may include periodic structures or textures such as moire or rosette patterns commonly encountered in halftoning.

(2)   Note. Processing print data may include compensation for unwanted print element (black dot) gain or loss.

SEE OR SEARCH CLASS:
345,   Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, subclass 611 for preventing, removing, or smoothing stair-step effects or jagged edges from displayed graphical objects (anti-aliasing).
348,   Television, subclasses 241 through 252, 606, and 607-624 for the elimination or compensation of unwanted or defective TV signals generated by a system, transmission medium, or video camera.
382,   Image Analysis, subclasses 260 through 265 for image processing operations that enhance images by suppressing or minimizing certain spatial frequencies, and subclass 275 for correcting undesirable image characteristics such as spatial distortion (i.e., subtracting difference data between frames to correct for blurring due to motion), sensor or optical system induced artifacts (i.e., geometric aberrations), process induced artifacts (i.e., "worm" artifacts caused by error diffusion), or physical deterioration of a scanned object itself (i.e., dirt or dust on photographic negatives).

3.27   Enhancement control in image reproduction (e.g., smoothing or sharpening edges):
This subclass is indented under subclass 1.9. Subject matter wherein image data or print is filtered or otherwise processed to enhance or restore an attribute in the reproduced image.

SEE OR SEARCH CLASS:
382,   Image Analysis, subclass 254 for improvement of pictorial or image information so that the result is more suitable than the original information for human or machine interpretation, and subclasses 266-269 for processing an image to visually enhance the outlines of individual characters or objects of interest in the image by emphasizing high frequency, transitional image data while de-emphasizing or removing low-frequency, homogeneous background image data.

3.28   Embedding a hidden or unobtrusive code or pattern in a reproduced image (e.g., a watermark):
This subclass is indented under subclass 1.9. Subject matter wherein a human or machine readable code, pattern, mark, symbol, or other information is electronically or digitally combined, embedded, or encrypted with an image such that when the image is reproduced by a printer, the combined, embedded, or encrypted information is visually hidden or imperceptible, or is esthetically unobtrusive to the appearance of the reproduced image.

(1)   Note. Examples of such hidden information would include a watermark, steganographic data, or a glyph code.

SEE OR SEARCH CLASS:
235,   Registers, subclass 494 for an object or record containing coded indicia adapted to be read by a machine where different items of information are represented by particular shaped patterns or arrangements (includes embedded codes).
283,   Printed Matter, subclass 113 for printed articles having a watermark.
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 629 through 641 for computer graphic processing to merge or overlay objects in an image to be displayed for visual viewing on a monitor or other selective (dynamic) display device.
348,   Television, subclass 589 for processing a television signal to include insertion of characters or graphics.
380,   Cryptography, subclass 54 for the modification of images using cryptography and subclass 55 for the production of printed copy using cryptography.
382,   Image Analysis, subclass 100 for image analysis applications that read, detect or modify watermarks or steganographic data embedded in images.
713,   Electrical Computers and Digital Processing Systems: Support, subclass 176 for authentication using digital watermarks.

3.29 **Engraving or perforating material to form a printing surface (e.g., printing plate, cylinder, or stencil):**
This subclass is indented under subclass 1.9. Subject matter wherein an image is engraved or perforated into a material to form a printing surface such as in the formation of a printing plate, cylinder, or stencil for use in a printing apparatus for image reproduction.

(1)   Note. A printing plate, cylinder, or stencil is usually formed by engraving, cutting, etching, perforating, or embossing a printing surface with images, patterns, characters, or designs, and is usually subsequently inked to form printed reproductions of the images, patterns, characters, or designs on a printing medium (e.g., paper).

SEE OR SEARCH CLASS:
101,   Printing, class definition, section entitled "Lines With Other Classes and Within This Class" for line with this class, and subclasses 3.1 through 32 , for embossing or Penetrating and for producing characters or designs on surfaces by dies adapted to deform or remove portions of material, and subclasses 463.1-473 for lithographic plate making and the manufacture of a printing plate having an ink-repellent portion and an ink-receptive portion thereon, and subclass 150 for intaglio and for printing done by means of surfaces dependent upon design-grooves to retain the ink.
219,   Electric Heating, subclasses 68 through 70 for cutting or disintegrating (e.g., machining engraving) to etch a monogram into a metal surface, subclasses 121.19-121.2 for etching or trimming using an electron beam to cut superficially or partially through the work piece, and subclasses 121.68-121.69 for etching or trimming using a laser to cut superficially or partially through the work piece.
409,   Gear Cutting, Milling or Planing, subclasses 86 through 91 for an apparatus particularly adapted to generate substantially the form of a separate member, i.e., a pattern member, of the same or different size including shaping in which the product corresponds to the shape of the pattern element in a relief or intaglio relationship, and subclass.
700,   Data Processing: Generic Control Systems or Specific Applications, subclasses 159 through 195   where product manufacturing involves the shaping of a solid work piece by a machine tool.

3.3 **Halftone pattern formed on printing surface:**
This subclass is indented under subclass 3.29. Subject matter wherein a halftone or halftone pattern is formed into a printing surface to provide for representation of a gray level in a printed halftone reproduction of a multi-level (gray level) image such as produced from a photograph.

3.31 **Character or design formed on printing surface (e.g., intaglio):**
This subclass is indented under subclass 3.29. Subject matter wherein a character, line drawing, or other design is formed into a printing surface to provide for representation of a binary (bi-level or two tone) design having sharp density gradients in a printed reproduction thereof.

3.32 **Mechanical arrangement for forming a printing surface:**
This subclass is indented under subclass 3.29. Subject matter wherein a mechanical or structural arrangement, or control thereof, is provided for forming a printing surface.

(1)   Note. A forme is a plate or drum which has had its surface engraved with images, patterns, characters, etc., and which is inked and used to print the images, patterns, characters, etc., on a printing medium (e.g., paper).

296 **Recording apparatus:**
This subclass is indented under subclass 400. Subject matter including structure to reproduce a picture by making a permanent record from the received picture signal on a record carrier.

SEE OR SEARCH CLASS:
346,   Recorders, appropriate subclasses for particular recording apparatus.

300   Electrostatic or electrolytic:
This subclass is indented under subclass 296. Subject matter wherein the picture is created by selectively applying a varying charge pattern to the record carrier in accordance with the picture signal and permanently affixing charged toner particles in amounts dependent on the charge, or by transmitting a current through the record carrier to selectively discolor the record.

SEE OR SEARCH CLASS:
346,   Recorders, subclass 150.3 for electrochemical recording of phenomenal information.
347,   Incremental Printing of Symbolic Information, subclasses 112+ and 163+ for electrostatic marking and electrochemical marking respectively.
399,   Electrophotography, subclasses 9+ for diagnostics, subclasses 38+ for controls, subclasses 130+ for image formation, subclasses 168+ for charging, subclasses 177+ for exposure, subclasses 222+ for development, subclasses 297+ for transfer, subclasses 320+ for fixing, subclasses 343+ for cleaning, and subclasses 361+ for document handling.

301   Magnetic:
This subclass is indented under subclass 296. Subject matter wherein the record carrier is magnetized in accordance with the picture signal and charged toner particles are affixed in amounts dependent on the magnetization of the record carrier.

(1)   Note. Only apparatus which produces a visibly readable record is included here. Apparatus for producing a nonvisible record by magnetization is in Class 360, Dynamic Magnetic Information Storage or Retrieval.

(2)   Note. The toner particles may be affixed permanently to the magnetized record carrier or transferred to a separate record carrier.

302   photographic:
This subclass is indented under subclass 296. Subject matter wherein the record carrier is a photosensitive medium.

SEE OR SEARCH CLASS:
346,   Recorders, subclasses 107.1+ for optical recording of phenomenal information.
347,   Incremental Printing of Symbolic Information, subclasses 224+ for radiation marking.
386,   Television Signal Processing for Dynamic Recording or Reproducing, subclasses 42+ and 128+ for recording or reproducing color and black and white television signal using light or beam.
399,   Electrophotography, subclasses 9+ for diagnostics, subclasses 38+ for controls, subclasses 130+ for image formation, subclasses 168+ for charging, subclasses 177+ for exposure, subclasses 222+ for development, subclasses 297+ for transfer, subclasses 320+ for fixing, subclasses 343+ for cleaning, and subclasses 361+ for document handling.

303   Pressure (e.g., on carbon paper):
This subclass is indented under subclass 296. Subject matter wherein the picture is created by selectively exerting pressure on a medium that transfers toner to a record carrier in accordance with the applied pressure.

304   With paper cutter:
This subclass is indented under subclass 296. Subject matter including means to sever from a length of record carrier, the portion that contains a reproduced picture.

305   MISCELLANEOUS:
This subclass is indented under the class definition. Subject matter relating to systems, transmitters or receivers specific to television or facsimile systems and not provided for in any of the preceding subclasses of this class.

400   FACSIMILE:
This subclass is indented under the class definition. Subject matter including generating and transmitting, recording, reproducing, or dis-

playing a scanned image representative electrical signal in which the local light variations composing the image are not subject to variation with time.

(1)   Note. Image includes graphical, text or pictorial matter.

SEE OR SEARCH CLASS:
178,   Telegraphy, subclass 37 for secret (i.e., automatic) insertion of printing telegraph recorder paper into an envelope.
345,   Computer Graphics Processing and Selective Visual Display Systems, subclasses 467 through 472.3 for character font generation.
347,   Incremental Printing of Symbolic Information, subclasses 224+ for radiation marking, particularly subclasses 225+ for marking a medium by scanning the medium with a writing beam (e.g., light, electron), and subclasses 129+ for generic electric marker where an electrostatic image is formed on a medium or discharged from a medium by scanning the medium with a beam of light.
379,   Telephonic Communications, subclasses 93+ for digital facsimile and subclass 100 for facsimile combined with a telephone or telephone system.
380,   Cryptography, subclasses 243 through 246 for encrypted facsimile transmission.
399,   Electrophotography, for electrophotographic devices without facsimile signal or without electric signal control of the light used to form the electrophotographic image, subclasses 9+ for diagnostics, subclasses 38+ for controls, subclasses 130+ for image formation, subclasses 168+ for charging, subclasses 177+ for exposure, subclasses 222+ for development, subclasses 297+ for transfer, subclasses 320+ for fixing, subclasses 343+ for cleaning, and subclasses 361+ for document handling.
430,   Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 31+, for electrophotographic methods without facsimile signal production or reception

or without electric signal control of the light used to form the electrophotographic image.
700,   Data Processing: Generic Control Systems or Specific Applications, subclasses 245 through 264 for data processing of robot control systems.
704,   Data Processing: Speech Signal Processing, Linguistics, Language Translation and Audio Compression/Decompression, subclasses 200+ for artificial intelligence systems that process speech signals, subclassees 500 through 504 for bandwidth, or time compression, or expansion of audio signals.
706,   Data Processing: Artificial Intelligence, various subclasses for artificial intelligence systems that represent, apply, and acquire knowledge.
709,   Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring or Plural Processor Synchronization, appropriate subclasses for data transferring among multiple computer systems.
710,   Electrical Computers and Digital Data Processing Systems: Input/Output, subclasses 1+ for transferring data from one or more peripherals to one or more computers for the latter to process, store, or further transfer or for transferring data from the computers to the peripherals.
715,   Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses 500 through 542 for document processing performed by a computer for presentation, and subclasses 700-866 for operator interface processing.
726,   Information Security, subclasses 1 through 36 for information security in computers or digital processing system.

401   **Image reproduction system:**
This subclass is indented under subclass 400. Subject matter wherein an image is converted into an electrical signal and then converted into another image without transmission of the signal to a remote location (e.g., a copier).

SEE OR SEARCH CLASS:
399,   Electrophotography, for electrophotographic devices without facsimile signal or without electric signal control of the light used to form the electrophotographic image, subclasses 9+ for diagnostics, subclasses 38+ for controls, subclasses 130+ for image formation, subclasses 168+ for charging, subclasses 177+ for exposure, subclasses 222+ for development, subclasses 297+ for transfer, subclasses 320+ for fixing, subclasses 343+ for cleaning, and subclasses 361+ for document handling.

402   Electronic mailbox:
This subclass is indented under subclass 400. Subject matter wherein documents are scanned and automatically directed to or transmitted to a designated one of a plurality of receivers for reproduction.

SEE OR SEARCH THIS CLASS, SUBCLASS:
440,   for facsimile systems with an auxiliary address signal.
474+,   for facsimile scanning in general.

SEE OR SEARCH CLASS:
379,   Telephonic Communications, subclass 93.24 for an electronic mail at a display station, and subclass 100.08 for an electronic mailbox at a facsimile system combined with a telephone system. for facsimile combined with a telephone or telephone system.

403   Document filing and retrieval system:
This subclass is indented under subclass 400. Subject matter wherein a document is scanned, assigned a classification and stored or filed, and then retrieved in accordance with the classification.

SEE OR SEARCH THIS CLASS, SUBCLASS:
402,   for electronic mailbox systems.
474+,   for facsimile scanning in general.

404   Facsimile memory monitoring:
This subclass is indented under subclass 400. Subject matter wherein the status of a memory is detected.

(1)   Note. Status includes amount of data in a memory, condition of a memory, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
406,   for facsimile measuring and testing.

405   Image transmission accuracy verification:
This subclass is indented under subclass 400. Subject matter wherein a transmitted or scanned image is compared or verified for accuracy (i.e., image abnormality) after transmission.

SEE OR SEARCH THIS CLASS, SUBCLASS:
406,   for facsimile measuring and testing.
461+,   for shade correction.

SEE OR SEARCH CLASS:
356,   Optics: Measuring and Testing, subclass 71, document pattern analysis or verification, for related subject matter under not involving a facsimile system.
382,   Image Analysis, subclasses 309+ for related subject matter in general.
714,   Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses for data verification in general.

406   Facsimile measuring, testing or calibrating:
This subclass is indented under subclass 400. Subject matter wherein a facsimile apparatus is monitored, measured, calibrated or tested.

SEE OR SEARCH THIS CLASS, SUBCLASS:
405,   for image verification.

SEE OR SEARCH CLASS:
324,   Electricity: Measuring and Testing, appropriate subclasses, for electrical measuring and testing.
714,   Error Detection/Correction and Fault Detection/Recovery, appropriate sublasses for data verification in general.

407   **Facsimile relay system:**
This subclass is indented under subclass 400. Subject matter wherein image information is received form a transmitter, and retransmitted to a receiver without reproduction.

SEE OR SEARCH CLASS:
375,   Pulse or Digital Communications, subclasses 211+ for pulse communications relays.
379,   Telephonic Communications, subclasses 338+ for telephone relays.
455,   Telecommunications, subclasses 7+ for radio relays.

408   **Plural scanner station:**
This subclass is indented under subclass 400. Subject matter wherein more than one scanner is employed for image generation at the same station.

SEE OR SEARCH THIS CLASS, SUBCLASS:
474+,   for facsimile scanning in general.

409   **Synchronization:**
This subclass is indented under subclass 400. Subject matter comprising methods or apparatus for maintaining proper time or phase correspondence between a transmitter and a receiver of the facsimile system.

SEE OR SEARCH CLASS:
348,   Television, subclasses 500+ for television synchronization.
361,   Electricity: Electrical Systems and Devices, subclasses 243+ for electrical systems including synchronization of shafts
370,   Multiplex Communications, subclasses 503+ for time division multiplex synchronization.
375,   Pulse or Digital Communications, subclasses 354+ for synchronizers in pulse communications.

410   **Sync or phase pulse generator:**
This subclass is indented under subclass 409. Subject matter for the generation or synchronizing or phasing pulses necessary for the proper synchronization between components of the facsimile system.

411   **Facsimile carrier as synchronization signal:**
This subclass is indented under subclass 409. Subject matter wherein a video carrier frequency of the transmitted facsimile signal is utilized to convey synchronization information.

412   **Phase or speed regulation:**
This subclass is indented under subclass 409. Subject matter for varying the phase or speed of components of the facsimile system to achieve proper synchronization between such components.

413   **Start - stop:**
This subclass is indented under subclass 412. Subject matter wherein synchronization between the components of the system is achieved by stopping the receiver scanning mechanism during each scan cycle and restarting the scan in accordance with a received phase or synchronization signal.

414   **With particular clutch mechanism:**
This subclass is indented under subclass 412. Subject matter including a particular device connecting and disconnecting a driving and a driven part of a facsimile mechanism to vary the phase or speed.

415   **With pendulum:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed control is achieved through the use of a body suspended from a fixed point so as to swing freely.

416   **With tuning fork:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed control is achieved by the use of a 2-pronged implement that vibrates with a fixed frequency when struck.

417   **With strobe:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed control is achieved through the use of a light that flashes at an adjustable rate.

418   **With movable phase shifter:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed control is achieved through the use of a mechanical phase shifter at the receiver.

419   **Receiver motor power transmitted from transmitter:**
This subclass is indented under subclass 412. Subject matter wherein the receiver has a motor and power for the motor is transmitted from the transmitter to maintain synchronization.

420   **Receiver motor power source frequency change:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed is regulated by changing the frequency of a source of power of a motor in a receiver.

421   **Receiver motor power source voltage change:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed is regulated by changing the voltage of a power source of a motor in a receiver motor.

422   **Receiver motor power source interruption:**
This subclass is indented under subclass 412. Subject matter wherein the phase or speed is regulated by selectively interrupting the power of a receiver motor.

423   **With resistance variable in receiver motor power source:**
This subclass is indented under subclass 412. Subject matter including a variable resistance in a power source of a motor to effect phase or speed regulation in a receiver.

424   **Stylus:**
This subclass is indented under subclass 412. Subject matter wherein styli which are scanning paths at the transmitter and at the receiver are maintained in proper phase or speed relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:
478,   for stylus scanning.

425   **Multiplex:**
This subclass is indented under subclass 400. Subject matter including transmitting plural diverse information signals at the same time.

SEE OR SEARCH CLASS:
348,   Television, subclasses 473+ for multiplex transmission in television.
370,   Multiplex Communications, appropriate subclasses for multiplex communications in general.

426.01   **Reduced time or bandwidth for static image communication:**
This subclass is indented under subclass 400. Subject matter wherein the reduction or compression of the frequency range of a static picture signal or amount of static image data (e.g., a document or photograph), or wherein the reduction of time required to transmit a static picture signal or static image data, is based on a bandwidth limitation of a transmission medium or a limitation of the transmitter, relay, or receiver used for communication of the static picture signal or static image data over a telephone network.

(1)   Note. Examples of telephone networks are Public Switched Telephone Networks and General Switched Telephone Networks.

SEE OR SEARCH THIS CLASS, SUBCLASS:
1.15,   for communication of compressed static image data in a digital network (e.g., ISDN, DSL, LAN, WAN, TCP/IP, Ethernet).

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, subclasses 50 through 107 for changing digital signals representing information to a different system of digital signals representing the same information.
348,   Television, subclasses 385.01 through 348.1 for analog implementations of bandwidth reduction or compression techniques applied to television or motion video signals.

370, Multiplex Communications, subclass 477 for bandwidth compression or expansion in multiplex communications.

375, Pulse or Digital Communications, subclasses 240.01 through 240.29 for digital implementations of bandwidth reduction, compression, or expansion techniques of television or motion video signals or motion image data.

379, Telephonic Communications, subclass 93.08 for compression/decompression transmission scheme of a digital voice message signal over a telephone line.

382, Image Analysis, subclass 166 for compression or compaction of a color image and subclasses 232-253 for image compression in general and subclasses 232 to 253 for compression/coding or decompression/decoding techniques, per se, applied to image signals or image data whether by analog or digital implementations.

455, Telecommunications, subclass 72 for compression (i.e., companding) and expansion of a message signal modulated onto a radio carrier wave by decreasing and expanding the range of variation of the modulating parameter in a complementary manner at the transmitter and receiver, respectively.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclasses 500 through 504 for bandwidth, or time compression, or expansion of audio signals.

709, Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring or Plural Processor Synchronization, subclass 247 for compressing/decompressing data transferred between computers in addition to other processing of the data by the computers before or after transfer to facilitate the transfer of data resulting from the other processing performed.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, subclass 68 for compacting data for more efficient transfer between or

storage in the peripheral and digital data processing system or computer.

426.02 Condition based selection or control of image coding technique or communication arrangement:
This subclass is indented under subclass 426.01. Subject matter wherein a technique for coding (encoding or compressing) a static image or decoding (decompressing or expanding) a coded static image, or a communication arrangement, to reduce or compress bandwidth, or to reduce the time or amount of image data to be transmitted, is adapted, controlled, or selected based on a communication condition.

(1) Note. A communication condition would include a condition or ability of the transmitter or receiver, a property or condition of the medium used for signal transmission, other processing performed before coding or after decoding, etc.

SEE OR SEARCH CLASS:
348, Television, subclasses 404.1 through 407.1 and 424.2 for adaptive motion image data compression.
375, Pulse or Digital Communications, subclass 240.02 for adaptive motion image data compression.
382, Image Analysis, subclass 238 for adaptive image data compression.

426.03 Transfer rate of an uncoded or decoded image:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on, the transfer rate of an original uncoded (uncompressed) image before coding at the transmitter, or the transfer rate of a decoded (decompressed or expanded) image after decoding at the receiver.

426.04 Processing or analysis of an uncoded or decoded image:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on, the transfer rate of an original uncoded (uncompressed)

image before coding at the transmitter, or the transfer rate of a decoded (decompressed or expanded) image after decoding at the receiver.

426.05   Storage arrangement or capacity:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on the storage condition for a coded, uncoded, or decoded image at either the receiver, transmitter, or an intermediate communication facility.

(1)   Note. An example of a storage condition is storage capacity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
404,   for monitoring or detecting the status of a memory in facsimile equipment, such as the amount of data in the memory or the capacity of the memory.

426.06   Amount of image data or code:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on the amount of image data to be coded or the resulting amount of coded image data to be transmitted at the transmitter, the amount of coded image data handled at an intermediate communication facility, or the amount of coded image data received or the resulting amount of decoded image data generated at the receiver.

426.07   Coding or decoding rate:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on a rate of image coding (compression rate) at the transmitter or a rate of coded image decoding (expansion rate) at the receiver.

426.08   Bandwidth or property of a communication medium:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or

decoding technique, or coded image communication arrangement, is dependent on the available bandwidth or other related property of the communication medium over which the coded image is transmitted.

(1)   Note. Selection of a transmission arrangement may include selection between different transmission mediums depending on the available bandwidth or other related properties of each transmission medium.

426.09   Communication error rate or level:
This subclass is indented under subclass 426.02. Subject matter wherein wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on the level, rate, or severity of errors occurring or predicted to occur during coded image communication, or during a calibration, training, or initialization procedure for transmitting a coded image between a transmitter and receiver, or via an intermediate communication facility.

(1)   Note. Training or initialization is often called hand shaking.

SEE OR SEARCH THIS CLASS, SUBCLASS:
437,   for detection of a break in facsimile operation and the resulting transmission of an auxiliary signal or other measure used to control the facsimile equipment.

SEE OR SEARCH CLASS:
714,   Error Detection/Correction and Fault Detection/Recovery, subclasses 704 through 708 for error rate determination, and subclasses 712-716 for communication facility testing.

426.1   Fill bit or dummy signal used:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image data coding or decoding technique, or compressed data transmission arrangement, involves the insertion of fill bits or dummy signals for the purposes of regulating or preventing interruption of transmission, or to accommodate prescribed

coding conditions such word length, line length, or block length without affecting operations.

SEE OR SEARCH CLASS:
348,   Television, subclass 245 for the use of dummy pixels in television.

426.11   Coded image communication rate:
This subclass is indented under subclass 426.02. Subject matter wherein the adaptation, control, or selection of the image coding or decoding technique, or coded image communication arrangement, is dependent on the rate or change in rate of transmission occurring or predicted to occur during coded image communication, or during a calibration, training, or initialization procedure for transmitting a coded image, between a transmitter and receiver, or via an intermediate communication facility.

(1)   Note. Training or initialization is often called hand shaking.

426.12   Auxiliary information transmitted (e.g., required to perform or identify decoding technique):
This subclass is indented under subclass 426.01. Subject matter wherein auxiliary or supplemental information is transmitted with a coded (compressed) image and is either required to perform a decoding (decompression) operation, identify a required decoding (decompression) technique to be performed, or provide other information about the coded image.

(1)   Note. The other information about the coded image may include amount of image data, type of image, number of pages, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
343   through 441, for transmission of auxiliary signals between a facsimile transmitter and receiver to provide synchronization, control, or instructions for other purposes.

426.13   Combined with lossless coding technique (e.g., fixed or variable run-length coding):
This subclass is indented under subclass 426.01. Subject matter wherein the reduction or compression of bandwidth or amount of image data involves a lossless coding technique where the original data prior to being coded (compressed) is regenerated through the corresponding lossless decoding technique.

(1)   Note. Lossless coding techniques include run-length, Huffman, MR, and MMR encoding.

(2)   Note. Lossless coding techniques, per se, are classified elsewhere, see the SEE OR SEARCH CLASS: below.

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, subclasses 50 through 107 for lossless coding techniques, per se.
348,   Television, subclasses 384.1 through 440.1 for lossless compression techniques for motion images, per se.
375,   Pulse or Digital Communications, subclasses 240 through 241 for lossless coding techniques, per se, in digital communications.
382,   Image Analysis, subclasses 244 through 247 for lossless coding techniques, per se, in image analysis.

426.14   Combined with lossy coding technique (e.g., coding of quantized transform coefficients):
This subclass is indented under subclass 426.01. Subject matter wherein the reduction or compression of a static image involves a lossy coding technique where the original image prior to being coded (compressed) is regenerated after coding with loss through the corresponding lossy decoding technique.

(1)   Note. Lossy coding techniques include JPEG or other technique involving quantization of transform coefficients.

(2)   Note. Lossy coding techniques, per se, are classified elsewhere, see the SEE OR SEARCH CLASS below.

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, subclasses 50 through 107 for lossy coding techniques, per se.
348,   Television, subclasses 384.1 through 440.1 for lossy compression techniques for motion images, per se.
375,   Pulse or Digital Communications, subclasses 240 through 241 for lossy coding techniques, per se, in digital communications.
382,   Image Analysis, subclasses 232 through 253 for lossy coding techniques, per se, in image analysis.

426.15   Coding for analog facsimile equipment (e.g., Group 1 or 2):
This subclass is indented under subclass 426.01. Subject matter wherein a static image is coded (compressed) and appropriately modulated for transmission over a telephone network between analog facsimile equipment (e.g., using the Group 1 or 2 Fax convention).

(1)   Note. Examples of telephone networks are Public Switched Telephone Networks and General Switched Telephone Networks.

426.16   Coding for digital facsimile equipment (e.g., Group 3 or 4):
This subclass is indented under subclass 426.01. Subject matter wherein a static image is coded (compressed) and appropriately modulated for transmission over a telephone network between digital facsimile equipment (e.g., using the Group 3 or 4 Fax convention).

(1)   Note. Examples of telephone networks are Public Switched Telephone Networks and General Switched Telephone Networks.

434   Auxiliary signal:
This subclass is indented under subclass 400. Subject matter including apparatus for transmitting a signal in either direction between a transmitter and a receiver for the purpose of giving instructions to either the transmitter or receiver or to convey information, other than pictorial or synchronization, about events or conditions at either location.

SEE OR SEARCH THIS CLASS, SUBCLASS:
409+,   for facsimile synchronization.

435   Transmitter and receiver both supply auxiliary signal(s):
This subclass is indented under subclass 434. Subject matter wherein both the receiver and the transmitter send information to each other.

SEE OR SEARCH CLASS:
379,   Telephonic Communications, subclasses 100.01+ for facsimile combined with a telephone or telephone system.

436   Auxiliary signal controls apparatus at both transmitter and receiver:
This subclass is indented under subclass 435. Subject matter wherein the auxiliary signal is employed by the transmitter to control the facsimile receiver or vice versa.

437   Interruption detection and control:
This subclass is indented under subclass 434. Subject matter wherein the auxiliary signal is transmitter upon detection of a break in facsimile operation and is used to control the equipment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
406,   for measuring and testing in facsimile.

438   Transmitter supplies auxiliary signal(s):
This subclass is indented under subclass 434. Subject matter wherein the auxiliary signal is generated in the facsimile transmitter.

439   Receiver supplies auxiliary signal(s):
This subclass is indented under subclass 434. Subject matter wherein the receiver transmits information to the transmitter.

440   Telephone number or address of designator:
This subclass is indented under subclass 434. Subject matter wherein the auxiliary signal carries information about the address or telephone number of the sender or recipient of the facsimile transmission.

(1)   Note. Class 379, Telephonic Communications provides, in subclasses 100.01+

for facsimile communications combined with a telephone system or part thereof.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
402,   for facsimile system wherein documents are transmitted to designated receivers.

SEE OR SEARCH CLASS:
340,   Communications: Electrical, subclasses 3.5 through 3.55 and 825.21 for selective communications with addressing.
360,   Dynamic Magnetic Information Storage or Retrieval, subclass 72.2 for magnetic tape recording with recorded addresses.
370,   Multiplex Communications, subclasses 312 and 432 for message addressed to multiple destinations, subclasses 352 and 389 for switching a message which includes an address header, and subclass 475 for address transmitted in multiplex communications.
379,   Telephonic Communications, subclasses 100.01+ for facsimile communications with a telephone device.

441   Facsimile alarm:
This subclass is indented under subclass 434. Subject matter having a humanly perceptible indication of an abnormal condition.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
405,   for image verification.
406,   for facsimile measuring or testing.

442   Facsimile system interface:
This subclass is indented under subclass 400. Subject matter having provision for enabling a transmitter to be compatible with a receiver and vice versa.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
409+,   for synchronization in facsimile.

443   Specific signal processing circuitry:
This subclass is indented under subclass 400. Subject matter including specific circuitry for facsimile but not restricted in usability to any

single system, signal generator or recorder specifically provided elsewhere in this class.

SEE OR SEARCH CLASS:
348,   Television, subclasses 607+ for noise elimination in a television systems and subclasses 678+ for automatic gain control circuitry used in television systems.

444   Memory interface:
This subclass is indented under subclass 443. Subject matter wherein a memory interfaces an input and an output of the facsimile systems to cause a significant change in the overall function of the system.

445   Signal sampling and conversion:
This subclass is indented under subclass 443. Subject matter wherein a facsimile signal is sampled and analog to digital conversion (or vice versa) is performed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
467,   for image classification and coding.
470,   for conversion of an analog facsimile signal into a coded digital signal.

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, subclasses 122+ for sampling and conversion in general.

446   Signal voltage or gain control:
This subclass is indented under subclass 443. Subject matter wherein the voltage or gain of a photocell or amplifier is controlled by specific circuitry responsive to specific conditions.

447   Subject enhancing:
This subclass is indented under subclass 443. Subject matter including circuitry for modifying or operating on selected portions of the signal to restore or improve detail in the reproduced image.

448   Image processing:
This subclass is indented under subclass 443. Subject matter wherein an image signal is processed in some manner to either change or improve the image for reproduction.

449   Document size detection:
This subclass is indented under subclass 448. Subject matter wherein a document or image size is detected for processing image signals generated therefrom.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
451,   for changing facsimile picture size.

450   Plural images combined into a single image:
This subclass is indented under subclass 448. Subject matter where more than one image representing signal are combined to form a signal representing one image.

451   Picture size conversion:
This subclass is indented under subclass 448. Subject matter including apparatus permitting the reproduced picture to be smaller or larger in size than the original picture.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
449,   for document size detection.

452   Image editing:
This subclass is indented under subclass 448. Subject matter wherein the image signal is edited by an operator before reproduction or transmission.

453   Image portion selection:
This subclass is indented under subclass 448. Subject matter wherein a portion of an entire image is selected for specific processing.

461   Shade correction:
This subclass is indented under subclass 455. Subject matter wherein a reference signal is used to determine or correct the proper level of the output signal generated by a picture signal generator.

462   Text and image detection and processing:
This subclass is indented under subclass 448. Subject matter including separate processing for detected s:graphic image and text images within a scanned document.

463   Noise elimination:
This subclass is indented under subclass 448. Subject matter wherein noise is limited or eliminated during image processing or whereby the signal to noise ratio is improved.

SEE OR SEARCH CLASS:
348,   Television, subclasses 607+ for noise elimination in a television signal.

464   To distinguish intelligence from background:
This subclass is indented under subclass 448. Subject matter including apparatus to generate a signal wherein a portion of the signal corresponding to intelligence on a document may be readily distinguished from a portion representing a background color of the document.

465   Picture signal thresholding:
This subclass is indented under subclass 448. Subject matter wherein the picture signal is thresholded by a unique technique for determining the level (black or white) of the picture.

466   Variable thresholding technique:
This subclass is indented under subclass 465. Subject matter wherein the type of thresholding technique is determined by the image portion being analyzed.

468   Facsimile control unit:
This subclass is indented under subclass 443. Subject matter wherein specific processing circuitry is directed to the control of a facsimile unit.

469   Carrier wave modulation:
This subclass is indented under subclass 443. Subject matter including circuitry to modulate a signal derived from scanning a picture onto a carrier or including circuitry to demodulate the signal to reconstruct the picture.

SEE OR SEARCH CLASS:
329,   Demodulators, appropriate subclasses for demodulators, per se.
332,   Modulators, appropriate subclasses for modulators, per se.
348,   Television, subclass 724 for transmitter circuitry in television systems including modulators and subclasses

726+ for receiver circuitry in television systems using demodulators.

455, Telecommunications, appropriate subclasses for circuitry to modulate or demodulate a carrier wave.

470   Coded character:
This subclass is indented under subclass 400. Subject matter including translation of an analog signal derived from scanning each elemental area of a picture into a digital coded signal.

(1)   Note. The subject matter in this subclass does not encode the signal for time or bandwidth reduction purposes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
445,   for signal sampling and conversion.
426+,   for encoding the picture signal for time or bandwidth compression purposes.
467,   for image classification and coding.

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, subclasses 20+ and 173+ for code transmitters, and subclasses 126+ for analog to or from digital conversion in general.

471   Picture signal generator:
This subclass is indented under subclass 400. Subject matter including apparatus or circuitry to detect or convert elemental light variations composing a picture into an electrical signal.

SEE OR SEARCH CLASS:
382,   Image Analysis, subclasses 312+ for related subject matter in general.

472   Combined read and write head:
This subclass is indented under subclass 471. Subject matter having a device which converts local light variations of a picture into a picture representative signal and converts a picture representative signal into a picture.

473   Hand held reader:
This subclass is indented under subclass 471. Subject matter having a device which is made to be held in an operator's hand and which converts local light variations into a picture representative signal.

474   Scanning:
This subclass is indented under subclass 471. Subject matter including apparatus to traverse a surface to derive information from a image or to reproduce a image.

SEE OR SEARCH THIS CLASS, SUBCLASS:
199+,   for scanning devices employed in television systems and employing mechanical optical means.
408,   for plural scanning stations.

SEE OR SEARCH CLASS:
250,   Radiant Energy, subclasses 234+, for photocell combined with moving optical systems.
359,   Optics: Systems (Including Communication) and Elements, subclasses 197+, for optical scanning systems, per se.

475   Facsimile illumination control:
This subclass is indented under subclass 474. Subject matter wherein the output of a light source employed for scanning is varied in response to specific conditions in the system.

SEE OR SEARCH CLASS:
362,   Illumination, appropriate subclass for illumination in general.

476   Transceiver:
This subclass is indented under subclass 474. Subject matter including structure wherein a portion of the scanning mechanism utilized in the generation of a picture signal may be utilized in the reception of the signal and recording of the picture.

SEE OR SEARCH THIS CLASS, SUBCLASS:
472,   for a transceiver with a combined read and write head.

477   Nonlight:
This subclass is indented under subclass 474. Subject matter where the scanning is of a detectable parameter other than light.

478   Stylus type:
This subclass is indented under subclass 477. Subject matter including a stylus for making contact with the picture.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
424,   for stylus synchronization.

479   Facsimile video:
This subclass is indented under subclass 474. Subject matter wherein a video camera scans documents or other static images.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
909,   for an electronic still camera or scene reproducer.

480   Coherent light:
This subclass is indented under subclass 474. Subject matter having a laser light source.

SEE OR SEARCH CLASS:
359,   Optics: Systems and Elements, subclasses 196+ and 237+, for modulation and scanning systems for laser beams.

481   Including a polygon reflector:
This subclass is indented under subclass 480. Subject matter wherein light is reflected from a rotating reflector having a polygonal cross section during scanning.

482   Solid-state:
This subclass is indented under subclass 474. Subject matter having a semiconductor device.

SEE OR SEARCH CLASS:
348,   Television, subclasses 272+ and 294+ for solid-state image sensors in television cameras.

483   Charge coupled device:
This subclass is indented under subclass 482. Subject matter including an array of charge storage elements on semiconductor base to which a variation in a electric charge field is applied to serially transfer charge through successive adjacent charge storage elements to an output terminal.

SEE OR SEARCH CLASS:
257,   Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 215+ for charge transfer type active semiconductor devices, per se.
348,   Television, subclasses 282+ and 311+ for charge-coupled devices in television cameras.

484   Fiber optics or optical waveguides:
This subclass is indented under subclass 474. Subject matter having transparent fibers, each longer than its diameter, so that they are capable of guiding light.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
901,   for fiber optics in pictorial communications in general.

SEE OR SEARCH CLASS:
250,   Radiant Energy, subclass 227 for photocells with optical or prephotocell systems including light conducting rods, E.G., optical fibers or waveguides.
385,   Optical Waveguides, for optical waveguides, per se.
398,   Optical Communications, subclasses 134, 141, 178, 200, and 214 for fibers optic communication.

485   Cathode-ray tube:
This subclass is indented under subclass 474. Subject matter having a vacuum tube which focuses an electron beam on a luminescent screen.

486   Scan rate or document movement variation in accordance with data presence:
This subclass is indented under subclass 474. Subject matter wherein the speed with the picture is scanned or moved through the scanning station is related to or dependent on the presence of data or the amount of data present.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
137,   for scan rate variation systems in television systems.

487   Facsimile transparency image scanning:
This subclass is indented under subclass 474. Subject matter wherein the document is in the form of a transparent sheet.

488   Document position detection:
This subclass is indented under subclass 474. Subject matter wherein the position of a document relative to a platen or scanning apparatus is detected.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
449,   for document size detection.

489   Helical scanning pattern:
This subclass is indented under subclass 474. Subject matter wherein the surface assumes a cylindrical shape and the scanning mechanism describes a helical pattern about the surface as the scanning proceeds.

SEE OR SEARCH CLASS:
346,   Recorders, subclass 138 for drum recorders.

490   Transparent drum:
This subclass is indented under subclass 489. Subject matter wherein the cylindrical shaped surface is light transmissive.

491   Internal scan:
This subclass is indented under subclass 490. Subject matter wherein the scanning is performed from within the cylindrical shaped surface.

492   Specified sheet clamp:
This subclass is indented under subclass 489. Subject matter including apparatus to maintain a scanned document in contact with the cylindrical shaped surface.

493   Curved scanning surface:
This subclass is indented under subclass 474. Subject matter wherein the surface assumes as arcuate shape and the scanning mechanism follows the arcuate shape.

494   Linear scanning pattern:
This subclass is indented under subclass 474. Subject matter wherein the surface is traversed a series of straight lines.

(1)   Note. Included in this subclass are scanning mechanisms wherein the surface may be cylindrical or curved, but the scanning is performed in a straight line parallel to the axis the cylinder or curved surface.

SEE OR SEARCH CLASS:
346,   Recorders, subclass 139 for marking devices wherein a marker moves in a straight line.
347,   Incremental Printing of Symbolic Information, subclasses 223+ for plural beam scanning apparatus and method, particularly subclass 238 for marking a scanned medium using light emitting diodes, and subclasses 129+ for generic electric markers where an electrostatic image is formed on a medium or discharged from a medium by scanning the medium with beam of light emitted from a light source, particularly subclass 130 for such an apparatus using light emitting diodes as the light source.

495   Spiral or helix aperture with linear aperture:
This subclass is indented under subclass 494. Subject matter wherein there are two surfaces between a source of light and a light responsive element, one surface having a linear aperture and the other surface having a helical aperture where the two apertures move relative to each other.

496   Document moves during scanning:
This subclass is indented under subclass 494. Subject matter wherein a document moves while being scanned.

497   Scanning element moves relative to a flat stationary document:
This subclass is indented under subclass 494. Subject matter wherein a scanning apparatus moves relative to a document being scanned.

498   Document feed:
This subclass is indented under subclass 474. Subject matter having a device to move sheets to be scanned to or from the scanner.

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500   NATURAL COLOR FACSIMILE:
This subclass is indented under the class definition. Subject matter including generating, transmitting, recording, reproducing, or displaying a picture representative signal which includes portions indicating the existing color of an original object, in which the local light variation composing the picture is not subject to variation with time.

(1)   Note. An original object may include a scene, an image, or a document which does not vary with time.

SEE OR SEARCH CLASS:
380,   Cryptography, subclasses 243 through 246 for secret facsimile equipment.

501   Image reproduction:
This subclass is indented under subclass 500. Subject matter wherein an image is converted to an electrical signal and then converted into another image without transmission of the signal to a remote location.

SEE OR SEARCH THIS CLASS, SUBCLASS:
401,   for image reproduction system in black and white facsimile.

502   Ink-Jet:
This subclass is indented under subclass 501. Subject matter wherein an image is formed on a recording sheet by means of nozzles which eject ink drops onto the sheet.

SEE OR SEARCH CLASS:
347,   Incremental Printing of Symbolic Information, see subclasses 1+   for selective marking by ink jet.

503   Thermal:
This subclass is indented under subclass 501. Subject matter wherein an image is formed on a recording sheet by means of a heating element which thermally fixes ink onto the sheet.

504   Measuring, testing, and calibrating:
This subclass is indented under subclass 500. Subject matter wherein a color facsimile device is monitored, measured, tested, or calibrated.

(1)   Note. Examples found herein are: Densities of neutral color patches and an image signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:
404,   for black and white facsimile memory monitoring.
405,   for black and white image transmission accuracy verification.
406,   for black and white facsimile measuring and testing.

505   Scanning:
This subclass is indented under subclass 500. Subject matter including means traversing a surface to derive information from an image or to reproduce an image.

SEE OR SEARCH THIS CLASS, SUBCLASS:
474+,   for scanning devices in black and white   facsimile.

506   Transparency image scanning:
This subclass is indented under subclass 505. Subject matter wherein the original object to be scanned is a film or transparent sheet.

507   Cathode-ray tube:
This subclass is indented under subclass 505. Subject matter wherein an image appearing on a space discharge display is scanned and reproduced.

508   Transceiver:
This subclass is indented under subclass 505. Subject matter having both a signal transmitter and a signal receiver at a common geos:graphic location for transmission and reception of separate signals.

SEE OR SEARCH CLASS:
379,   Telephonic Communications, subclasses 100.01+ for facsimile combined with a telephone system.
455,   Telecommunications, subclasses 73+ for radio transceivers.

509   **Illumination:**
This subclass is indented under subclass 505. Subject matter including specific characteristics or details of a light source used in scanning an original image or object.

SEE OR SEARCH CLASS:
362,   Illumination, subclasses 3+ for photographic lighting.

510   **Coherent light:**
This subclass is indented under subclass 509. Subject matter including a laser light source.

511   **With prism:**
This subclass is indented under subclass 505. Subject matter wherein a prism is used to separate a reflected light into a plurality of colored lights.

(1)   Note. A prism may be a birefringent element which is formed into a structure bound in part by two plane faces that are not parallel.

SEE OR SEARCH CLASS:
359,   Optics: Systems and Elements, subclasses 831+ for prism, per se.

512   **With color filters:**
This subclass is indented under subclass 505. Subject matter wherein filters of different colors convert a light reflected from an original color into light rays of different colors.

513   **Solid-state:**
This subclass is indented under subclass 505. Subject matter wherein a scanning element is a semiconductor device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
213.11+, for scanned solid-state devices in television picture signal generators.
482+,   for solid-state in black and white facsimile.

514   **With plural sensors:**
This subclass is indented under subclass 513. Subject matter wherein the semiconductor device includes a plurality of reading elements for converting an image into color image signals.

515   **Color separation:**
This subclass is indented under subclass 500. Subject matter wherein a color image signal is decomposed into a plurality of color signals corresponding to each of a plurality of primary colors (e.g., red, blue, and green) before processing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
518,   for color correction in natural color facsimile.

516   **White balance correction:**
This subclass is indented under subclass 515. Subject matter wherein a gain of the primary color signals is adjusted to a proper level by using amplifiers.

517   **Color masking:**
This subclass is indented under subclass 515. Subject matter wherein selected portions of an original color image are covered with a layer of opaque material so as to be eliminated from the color separated image.

518   **Color correction:**
This subclass is indented under subclass 500. Subject matter including means for modifying signals representative of various colors in a picture to ultimately reproduce a color picture that is a true representation of the original picture.

SEE OR SEARCH THIS CLASS, SUBCLASS:
515,   for color separation in natural color facsimile.

519   **Gamma correction:**
This subclass is indented under subclass 518. Subject matter for correcting a nonlinear input to output characteristics of a color image facsimile system.

SEE OR SEARCH THIS CLASS, SUBCLASS:
400+,   for black and white facsimile.

520   **Hue, saturation and luminance:**
This subclass is indented under subclass 518. Subject matter wherein the color correction is modified by (a) changing the dimension of

color that refers to a scale of perception rang-
ing from red through yellow, green and blue,
and circulates back to red; (b) a pure color;
(i.e., one not mixed with white light); or (c) a
photometric quantity of light radiation.

521   Gradation:
This subclass is indented under subclass 518.
Subject matter for controlling an optical color
density of an image.

522   With histogram:
This subclass is indented under subclass 518.
Subject matter including means for generating
a graphical representation of a frequency distri-
bution of color densities.

523   This subclass is indented under subclass 518.
With memory for storage of conversion data:
Subject matter including means for retaining
color conversion data to be used in processing
a color image.

SEE OR SEARCH CLASS:
365,   Static   Information   Storage   and
        Retrieval, for static memory devices,
        per se.

524   Intermediate storage:
This subclass is indented under subclass 500.
Subject matter including means for storage of
signals prior to reproduction of the picture.

SEE OR SEARCH CLASS:
318,   Electricity: Motive Power Systems,
        subclasses 567+ and classes indicated
        in the search notes under the class def-
        inition for program or pattern con-
        trolled devices.

525   Interpolation:
This subclass is indented under subclass 500.
Subject matter including a determination or
estimation of a value of a picture signal
between two known values or of a trend estab-
lished between two or more known values of a
picture signal.

SEE OR SEARCH CLASS:
708,   Electrical Computers: Arithmetic Pro-
        cessing and Calculating, subclasses
        290 and 847 for interpolation in data
        processing.

526   With mark-forming function:
This subclass is indented under subclass 500.
Subject matter wherein reference marks are
formed at predetermined positions of an image
forming medium so as to provide alignment of
color separated image reproductions.

527   Color photography previewer:
This subclass is indented under subclass 500.
Subject matter including means for adjusting a
quality or characteristics of a displayed picture
and providing an indication of various parame-
ters necessary to photographically reproduce
an image of the displayed picture.

528   Size variation:
This subclass is indented under subclass 500.
Subject matter for providing a reproduction of
a size different from the original object size.

529   Black signal synthesis:
This subclass is indented under subclass 500.
Subject matter for deriving a signal obtained
from a black color of high density in a printout
image.

530   Specific image-processing circuitry:
This subclass is indented under subclass 500.
Subject matter including details of circuitry for
processing an image signal in some manner to
either change or improve the image for repro-
duction.

SEE OR SEARCH THIS CLASS, SUB-
CLASS:
160+,   for specific processing circuitry of
        television in general.
443+,   for specific signal processing circuitry
        in black and white facsimile, in gen-
        eral.

531   Electronic retouch:
This subclass is indented under subclass 530.
Subject matter including electronic means for
improving or changing a color image by adding
details to or removing flaws that exist in the
original object.

532   Sharpness emphasizing:
This subclass is indented under subclass 530.
Subject matter including means for enhancing
contrast edges to improve detail in a color
image.

533   **Moire reduction:**
This subclass is indented under subclass 530. Subject matter including means for reducing the occurrence of a convergence of lines in color scanners.

534   **Halftone processing:**
This subclass is indented under subclass 530. Subject matter wherein shades of various darkness between the darkest and lightest elements of the original object are represented by a pattern of dots of varying density in the image.

SEE OR SEARCH THIS CLASS, SUBCLASS:
456+,   for halftone or grey level processing in black and white facsimile.

535   **Matrix:**
This subclass is indented under subclass 534. Subject matter wherein an image signal has one or more reference levels which are successively varied.

SEE OR SEARCH THIS CLASS, SUBCLASS:
30,   for matrixing or mixing in natural color television.

SEE OR SEARCH CLASS:
428,   Stock Material or Miscellaneous Articles, subclass 908 for a print matrix.

536   **Halftone screening:**
This subclass is indented under subclass 534. Subject matter wherein a halftone reproduction of an original is reproduced on a recording medium by means of a recording element using screens formed of periodically repeated, adjacent screen grid elements.

537   **Image editing:**
This subclass is indented under subclass 530. Subject matter wherein a specific image signal is edited by an operator before reproduction or transmission.

SEE OR SEARCH THIS CLASS, SUBCLASS:
448+,   for image processing in black and white facsimile.

538   **Image portion selection:**
This subclass is indented under subclass 530. Subject matter wherein a portion of an entire image is selected for specific processing.

539   **Image coding (encoder/decoder):**
This subclass is indented under subclass 530. Subject matter including means for converting image analog signals into digital information or vice versa.

SEE OR SEARCH THIS CLASS, SUBCLASS:
467,   for image classification and coding in black and white facsimile.

SEE OR SEARCH CLASS:
341,   Coded Data Generation or Conversion, for analog to digital conversion, in general.

540   **Composite image:**
This subclass is indented under subclass 530. Subject matter wherein a plurality of image signals are combined to form a signal representing a single image.

CROSS-REFERENCE ART COLLECTIONS

The following subclasses are collections of cross-references of published disclosures pertaining to various specified aspects of the television art which aspects do not form appropriate bases for subclasses in the foregoing classification (i.e., subclasses superior hereto in the schedule). These subclasses assist a search based on remote function of the apparatus and may be of further assistance to the searcher as a starting point in further related fields of search either inside or outside the class. Thus, there is here provided second access for retrieval of a limited number of types of disclosures.

(1)   Note. Disclosures are placed in these subclasses for their value as references and as leads to appropriate main or secondary fields of search without regard to their original classification.

(2)   Note. The disclosures cross-referenced into the following subclasses are examples only of the indicated subject matter, and in no instance do they represent the entire extent of the prior art.

901.1 FIBER OPTICS:
Art collection of fiber optics utilized with or as components of facsimile systems.

SEE OR SEARCH CLASS:
250, Radiant Energy, subclasses 227.11+ for light rods utilized in optical or prephotocell systems.
355, Photocopying, subclass 1 for fiber optics utilized in photocopying devices.
359, Optics: Systems and Elements, subclasses 109+ for optical communication systems which may utilize fiber optics.
385, Optical Waveguides, appropriate subclasses for fiber optic in general.

906 HANDHELD CAMERA WITH RECORDER IN A SINGLE UNIT:
Subject matter where there is a portable television camera and a television signal recorder combined into a single unit.

(1) Note. The recorder may be mounted on a camera operator's belt and attached to the camera by a cable.

907 TRACK SKIPPERS (I.E., "GROOVE SKIPPERS"):
Subject matter having a record medium on which is recorded a television signal in a series of tracks or grooves and a transducer for reading the recorded television signal, wherein the transducer is caused to jump over or skip one or more recorded grooves or tracks.

908 PAUSE CONTROL (I.E., "COMMERCIAL KILLERS"):
Subject matter where a recording operation is automatically interrupted in response to a detected characteristic of a television signal being recorded.

909.1 ELECTRONIC STILL CAMERA OR SCENE REPRODUCER:
Art collection of electronic photography subsystem to generate and store, or to retrieve and display an electrical signal indicative of a substantially instantaneous color or monochromatic image of a scene, or a component peculiar thereto.

(1) Note. The storage and retrieval is exclusively dynamic recording or reproduction, the static storage is dealt with in Class 348, Television, subclasses 231+ and 714+.

(2) Note. Included in this art collection is the reproduction of the scene on photographic media or by printing.

FOREIGN ART COLLECTIONS

The definitions of the Foreign Patent/NPL Art Collections below correspond to the definitions of the abolished subclasses from which these Collections were formed. See the Foreign Patent/NPL Art Collection schedule for specific correspondences.

FOR 142 STATIC PRESENTATION PROCESSING (E.G., FOR A PRINTER):
Foreign art collections including subject matter wherein the processed data is presented for viewing on a fixed medium, such as paper.

FOR 143 Size or scale control:
Foreign art collections including subject matter wherein the processed data presented is magnified or reduced or proportioned for presentation.

FOR 144 Plotters:
Foreign art collections including subject matter wherein presentation is performed by X-Y movement of a marking means wherein the motion is controlled by the presentation data.

FOR 145 Plural marking means:
Foreign art collections including subject matter wherein more than one independently movable or different type of writing element is used for presenting the processed data.

FOR 146 Position or velocity determined:
Foreign art collections including subject matter wherein the position or speed of the marking means or image medium modifies the presentation of the data.

FOR 147 Specific to image source:
Foreign art collections including subject matter wherein image data format or pro-

cessing thereof is designed to function with a particular image source.

FOR 148　Flying dot (e.g., laser beam):
Foreign art collections including subject matter wherein the presentation on a fixed medium is produced by means of a continuously moving beam or stream of ink, light, ions, electrons, or radiation.

FOR 149　Dot matrix array (e.g., printheads):
Foreign art collections including subject matter wherein presentation of processed data is produced by means of an array of plural writing elements that are in a fixed position relative to each other.

FOR 150　Attribute control:
Foreign art collections including subject matter wherein the presentation data is modified, altered or stabilized to control the color, contrast, resolution, or intensity of the static presentation (e.g., halftone).

FOR 151　Character or font:
Foreign art collections including subject matter wherein the processing of presentation data generates or retrieves patterns defining alphanumerics.

FOR 152　Details of medium positioning (e.g., movement to or from presentation location of medium):
Foreign art collections including subject matter wherein the presentation data affects or is affected by the movement of the fixed medium to or from the location of the actual presentation.

FOR 153　Emulation or plural modes:
Foreign art collections including subject matter wherein data is modified such that a presentation system responds like, reacts like, or imitates another type of presentation system or has more than one mode of operation.

FOR 154　Data corruption, power interruption or print prevention:
Foreign art collections including subject matter wherein presentation operations are performed in which systems, devices, or events are monitored for errors, faults, malfunctions, deviations or security consider-

ations for expected results or steps are taken to prevent the occurrence of such errors, or to prevent presentation operations.

FOR 155　With communications (e.g., data compression, data expansion, plural devices):
Foreign art collections including subject matter with details of communication between elements within a static presentation system.

FOR 156　With memory:
Foreign art collections including subject matter with details of memory configuration, storage or retrieval of data to be presented.

FOR 157　Page or frame memory:
Foreign art collections including subject matter wherein a significant portion of the data is stored as a contiguous unit in the form to be presented.

FOR 158　Details of image placement or content:
Foreign art collections including subject matter wherein the format of the presentation data is controlled.

FOR 159　Time or bandwidth compression:
Foreign art collection including subject matter wherein the frequency range of the picture signal is reduced to accommodate bandwidth limitations of a transmission medium or wherein the time required to transmit a given amount of information through a given fixed bandwidth medium is reduced.

FOR 160　Run length encoding:
Foreign art collection including subject matter including apparatus for sensing and counting the number of consecutive elemental areas in which a given signal level exists and transmitting a signal representative of the count or a signal that is encoded to represent the count.

FOR 161　Predictive of adaptive encoding:
Foreign art collection including subject matter for converting facsimile signals to or from digital signals wherein the coding of the current information varies depending upon the nature of the previous information.

FOR 162 Two dimensional encoding:
Foreign art collection including subject matter where the run length extends over more than one scan line.

FOR 163 Using Huffman code:
Foreign art collection including subject matter wherein bandwidth compression is achieved by using various code words which are generated based on the probability of character or symbol occurrence.

FOR 164 Having addressable memory:
Foreign art collection including subject matter including a random access storage device.

FOR 165 Two level to three level:
Foreign art collection including subject matter wherein the excursions of the signal above its lower level or the average D.C. level of the signal is altered such that the signal level periodically alternates above and below a zero D.C. level.

FOR 166 Interpolation:
Foreign art collection including subject matter including a determination or estimation of a value or values of a picture signal between two known values or of a trend established between two or more known values of the picture signal.

FOR 167 Halftone or gray level processing:
Foreign art collection including subject matter wherein time of bandwidth compression involves a signal representing a shade of gray between the darkest and the lightest elements of the image.

FOR 168 Adaptive or predictive:
Foreign art collection including subject matter wherein the compression of the current information varies depending upon the nature of the previous information.

FOR 169 Fill bits or dummy signal:
Foreign art collection including subject matter wherein the picture signal includes a unit of information inserted solely for the purposes of fulfilling such prescribed conditions as word length or block length without affecting operations.

FOR 170 Two dimensional or orthogonal:
Foreign art collection including subject matter wherein time or bandwidth compression is based on a value of picture compression is based on a value of picture signal information displaced in two dimensions relative to reference picture signal information.

FOR 171 Block:
Foreign art collection including subject matter wherein the time of bandwidth compression is based on a matrix of m x n image elements where m and n are both positive integers greater than one but less that the number of image elements in a scan line.

FOR 172 Moir\'e9 effect elimination:
Foreign art collection including subject matter wherein wavy patterns produced by the convergence of lines are eliminated.

FOR 173 Gray level processing:
Foreign art collection including subject matter wherein the image signal is processed to reproduce various levels of gray.

FOR 174 Halftone:
Foreign art collection including subject matter where shades of fray between the darkest and the lightest elements of the image are represented by a pattern of "dots" of varying density.

FOR 175 Dither matrix:
Foreign art collection including subject matter where wherein a relationship between the optical density of an image and a signal level is controlled or an image is processed to provide emphasis in a specific frequency range.

FOR 176 Gradation or spatial processing:
Foreign art collection including subject matter wherein a relationship between the optical density of an image and a signal level is controlled or an image is processed to provide emphasis in a specific frequency range.

FOR 177 Variable halftone dot shape or size:
Foreign art collection including subject matter where the halftone "dot" has a variable shape or size.

FOR 178   Addressable storage:
Foreign art collection including subject matter including a random access memory.

FOR 179   Image classification and coding:
Foreign art collection including subject matter wherein portions of the image are detected, classified and processed accordingly.

FOR 180   Ablative:
Foreign art collection including subject matter wherein the picture is created by removal of portions of the record carrier.

FOR 181   Halftone:
Foreign art collection including subject matter including apparatus to create a halftone picture.

FOR 182   Engraving:
Foreign art collection including subject matter wherein the halftone picture is created by selectively removing material form the record carrier.

END